

Introduce

IGEM

The iGEM foundation is dedicated to education and competition, advancement of synthetic biology, and the development of open community and collaboration. The main program at the iGEM Foundation is the International Genetically Engineered Machine (iGEM) Competition. The iGEM Competition is the premiere student competition in Synthetic Biology. Since 2004, participants of the competition have experienced education, teamwork, sharing, and more in a unique competition setting. iGEM is also much more than a competition; our community has a long history of involving students and the public in the development of the new field of synthetic biology.

Synthetic biology

Synthetic biology is an interdisciplinary branch of biology and engineering, 2003 International is defined as the study of artificial biological systems, genetic engineering and engineering method based on systems biology, from the gene fragment, DNA molecule, gene regulatory networks and signal transduction pathways to the design and synthesis of artificial cells, similar to the modern integrated construction, principle and the method used in the field of biotechnology engineering, genetic engineering and cell engineering; basic method of synthetic biology, computational biology and chemistry biology together constitute the biological technology system.

Genetically modified food

International consensus has been reached on the principles regarding evaluation of the food safety of genetically modified plants. The concept of substantial equivalence has been developed as part of a safety evaluation framework, based on the idea that existing foods can serve as a basis for comparing the properties of genetically modified foods with the appropriate counterpart. Application of the concept is not a safety assessment per se, but helps to identify similarities and differences between the existing food and the new product, which are then subject to further toxicological investigation. Substantial equivalence is a starting point in the safety evaluation, rather than an endpoint of the assessment. Consensus on practical application of the principle should be further elaborated. Experiences with the safety testing of newly inserted proteins and of whole genetically modified foods are reviewed, and limitations of current test methodologies are discussed. The development and validation of new profiling methods such as DNA microarray technology, proteomics, and metabolomics for the identification and characterization of unintended effects, which may occur as a result of the genetic modification, is recommended. The assessment of the allergenicity of newly inserted proteins and of marker genes is discussed. An issue that will gain importance in the near future is that of post-marketing surveillance of the foods derived from genetically modified crops. It is concluded, among others that, that application of the principle of substantial equivalence has proven adequate, and that no alternative adequate safety assessment strategies are available.

Antibiotics

Antibiotics or antibacterials are a type of antimicrobial used in the treatment and prevention of bacterial infection. They may either kill or inhibit the growth of bacteria. Several antibiotics are also effective against fungi and protozoans, and some are toxic to humans and animals, even when given in therapeutic dosage.

AngioChip

Whether in preclinical studies in drug development, in place of experimental animals, or for organ transplantation, artificial organs and tissues have a very attractive application prospects. However, in vitro artificial organs and tissues in vivo to survive and play biological functions, in addition to considering the immune rejection, another problem can not be ignored: artificial organs from the surface to the deep part of the supply of oxygen and nutrients decreased gradually, so that the center of the cell and tissue necrosis may occur.